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A KEY TO THE HIGHER ALGÆ OF THE ATLANTIC COAST, BETWEEN NEWFOUNDLAND AND FLORIDA.

BY PROF. D. S. JORDAN.

IN the preparation of this Key, the principal work of which use has been made is Prof. W. H. Harvey's Nereis Boreali-Americana. The characters of the higher groups have been to a great extent copied or abridged from that work, and Harvey's Nomenclature and arrangement of families have been generally followed. In several instances, doubtful species have been suppressed or omitted.

Although the number of species recognized by Harvey is much less than has been admitted by previous writers, a still further reduction would be an advantage. Perhaps one-sixth of the species described in the Nereis might with propriety be considered as varieties.

The author has tried to render the Key as simple, compact and easy of comprehension as possible. Obvious characters, whereever available, have been used in preference to technical ones, as the structures on which the classification is really based are microscopic and often hard to ascertain.

Special technical terms are generally avoided, and those not used in Gray's "Manual of Botany" are defined where they occur.

Among plants so little known and which vary so widely as the Algæ, a synoptical table by which any specimen in any condition may be identified, is, of course, impossible, but it is hoped that this Key is sufficiently plain and accurate that nine specimens in every ten may be readily classified by its aid.

SUB-CLASS I. MELANOSPERMEÆ.

(OLIVE-GREEN ALGÆ).

Plants olive-green or olive-brown, never showing tints of red. Fructification monœcious or diœcious. Spores olive-colored, either external or contained singly or in groups in proper conceptacles; each spore enveloped in a pellucid skin, simple or finally separating into two, four or eight sporules. Antheridia, or transparent cells filled with orange-colored, vivacious corpuscles, moving by means of vibratile cilia.

Marine, often of large size, mostly between tide marks, **A**

A. FROND LEATHERY OR MEMBRANACEOUS, FORMING A COMPACT CELLULAR SUBSTANCE, ... **B**

A. FROND OF JOINTED FILAMENTS WHICH ARE EITHER FREE OR UNITED IN A COMPOUND BODY, ... **C**

B. *Spores in spherical cavities in the frond; air vessels commonly present; large, tough plants,* . FUCACEÆ. **D**

B. *Spores in indefinite cloud-like patches on the surface of the frond, which is usually large and stipitate, sometimes deeply divided, but never truly branched,* LAMINARIACEÆ. **F**

B. *Spores attached to external jointed filaments; ours, slender deep water species becoming blackish-green in drying,* . . . . SPOROCHNACEÆ. **E**

B. *Spores in definite groups (sori) on the surface of the frond; fronds smallish, juiceless, the surface netted with small cells,* . . . . . DICTYOTACEÆ. **H**

C. *Spores immersed; fronds not jointed, except in a few small parasites in which the filaments are connected at base,* . . . . CHORDARIACEÆ. **K**

C. *Spores external; fronds either obviously jointed or else surrounded by whorled branchlets,* ECTOCARPACEÆ. **N**

D. Frond leafy; air vessels stalked separate, ... *Sargassum.* **Q**
D. Frond leaf-like below; air vessels in terminal branchlets, pod-like, several celled, ... *Halidrys.* **T**
D. Frond dichotomous; receptacles filled with mucous; air vessels, if present, not as above, ... *Fucus.* **U**
E. Frond slender, with whorls of delicate filaments at the nodes, *Arthocladia.* **X**
E. Frond pinnate, solid, ... *Desmarestia.* **Y**
F. Frond flat, with a midvein, ... **G**
F. Frond flat, without a midvein, ... *Laminaria.* **Z**

F.	Frond cylindrical, septate within,	*Chorda.*	e
G.	Frond pierced with large roundish holes,	*Agarum.*	d
G.	Frond not pierced with holes,	*Alaria.*	c
H.	Frond branching,		J
H.	Frond simple,		I
I.	Frond flat, without midvein,	*Punctaria.*	i
I.	Frond bag-like, or worm-like, not constricted,	*Asperococcus.*	k
J.	Dichotomous, with wide axils,	*Stilophora.*	f
J.	Stem mostly excurrent with many long branches,	*Dictyosiphon.*	g
J.	Frond tubular; branches opposite, tapering to each end,	*Striaria.*	h
K.	Frond cylindrical, branching,		L
K.	Small or minute parasites composed of densely tufted filaments connected at base, free above,		M
K.	Frond tuber-shaped, irregular,	*Leathesia.*	n
L.	Axis cartilaginous, dense; filaments of periphery unbranched; long, slender species	*Chordaria.*	l
L.	Axis gelatinous, lax; peripheral filaments branched.	*Mesogloia.*	m
M.	Tufts on Fucus; ¼ to 1 inch high,	*Elachista.*	o
M.	Forming minute brown patches on Ulva, etc.,	*Myrionema.*	p
N.	Frond rigid; each joint of numerous cells,		O
N.	Frond soft; each joint of a single cell,		P
O.	Stems not obviously jointed; branchlets whorled,	*Cladostephus.*	q
O.	Whole frond articulate; pinnately branched,	*Sphacelaria.*	r
P.	Frond capillary, much branched,	*Ectocarpus.*	s
P.	Frond simple, with clusters of small branchlets,	*Myriotrichia.*	x
Q.	Air vessels tipped with filiform points.		S
Q.	Air vessels nearly or quite pointless.		R
R.	Leaves glandular; air vessels not longer than their pedicels.		1
R.	Leaves nearly glandless; pedicels very short.		4
S.	Leaves narrow, repand or sub-entire.		2
S.	Leaves broader, sharply serrate.		3
T.	Frond compressed, repeatedly pinnate.		5
U.	Frond flat, with a midrib.		V
U.	Frond compressed, without a midrib.		6
V.	Air vessels usually present; coarse species more common than the next.		7
V.	No air vessels; frond serrate.		10
V.	No air vessels; margins entire.		W
W.	Receptacles obtuse; northern.		8
W.	Receptacles acute; river mouths, etc.		9
X.	Young stems villous; deep water; rare.		11
Y.	Frond cylindrical; branches opposite.		12
Y.	Branches flattish, alternate, either with tufts of bright green filaments, or subulate spines.		13
Z.	Frond undivided, or cleft only at apex.		a
Z.	Frond finally deeply cleft.		b
a.	Stipe very long, hollow, largest midway; deep water.		17

a.	Stipe short, cylindrical, solid; margin of frond wavy or ruffled; very large.	14
a.	Stipe flat, winged; frond very long, narrow.	16
a.	Stipe short, flattened; much smaller and more delicate than the preceding huge " oar-weeds " and "tangles."	18
b.	Stipe nearly round, 1 to 6 feet long; common.	15
b.	Stipe flat, 3 to 4 inches long; rare.	19
c.	Frond pinnatifid below, with veinless leaflets.	20
d.	Rocks, etc., below low tide; common N.	21
e.	Frond constricted at intervals, 1 to 2 feet long.	23
e.	Frond not constricted, 1 to 40 feet long.	22
f.	Adhering strongly to paper; rare.	24
g.	On stones, Fucus, Chordaria, etc.; common.	25
h.	Fruit — groups of spores in transverse lines.	26
i.	Frond tapering each way; 1 to 4 lines wide.	27
i.	Frond an inch or more wide.	j
j.	Dark green; attenuate to base.	28
j.	Pale; abruptly tapering to base.	29
k.	Fruit — minute, scattered dot-like sori.	30
l.	Frond with long, filiform, sub-simple branches.	31
l.	Irregularly, mostly dichotomously branched.	32
m.	Slender, with a few short branches; on Zostera.	35
m.	Clumsy with long worm-like branches.	33
m.	Filiform; branches long; branchlets short; axils wide.	34
n.	On Corallina, etc.; tuber size of a walnut or less, becoming finally hollow.	36
o.	Brown pencil-like tufts on the common Fuci.	37
p.	Several species probably here; the commonest is	38
q.	Branches slender; branchlets forked, regularly whorled.	39
q.	Coarser, branchlets simple, irregularly whorled.	40
r.	In globose tufts on small Algæ.	41
r.	In spreading patches on rocks and sand.	42
s.	Branches mostly opposite or in fours.	t
s.	Branches mostly alternate.	u
t.	Propagula (pod-like bodies regarded as the fructification, which are formed by partial or entire transformation of a branch) elliptical, sessile.	48
t.	Propagula forming swellings in the lesser branches.	43
u.	Joints of stem decidedly longer than broad.	w
u.	Joints of stem not longer than broad.	v
v.	Zigzag, much forked; small spine-like branchlets at nearly every joint.	51
v.	Stem excurrent; propagula elliptical; branches erect.	49
v.	Propagula elongated; our commonest Ectocarpus.	44
w.	Propagula linear, tipped with points formed in the ultimate branchlets.	45
w.	Tufts sponge-like, densely interwoven.	46

w. Branches with short, remote, horizontal, spine-like branchlets. **52**
w. Not as above; long, loose and feathery. **50**
x. On Chorda, Dictyosiphon, etc. Stem flexuous. **53**

LIST OF SPECIES.

In the following list the distribution of each plant is given, as far as known. The figures refer to the average height of the plant in inches.

1. SARGASSUM[*] VULGARE Agardh (*Sea-Lentils*). Cape Cod and South. 12–36.
2. SARGASSUM MONTAGNEI Bailey. Rhode Island and South. 12–30.
3. SARGASSUM BACCIFERUM Agardh. (*Sea-grapes, Gulf-weed.*) Gulf Stream. 12–40.
4. SARGASSUM HYSTRIX Agardh. Gulf Stream. 12–20.
5. HALIDRYS SILICULOSA Lyngby. Newfoundland. 10–50.
6. FUCUS NODOSUS Linnæus. New York and North. 10–50.
7. FUCUS VESCICULOSUS Linnæus. New Jersey and North. 6–30.
8. FUCUS FURCATUS Agardh. Newfoundland. 12–20.
9. FUCUS CERANOIDES Linnæus. New York. 10–25.
10. FUCUS SERRATUS Linnæus. Massachusetts and North. 24–40.
11. ARTHOCLADIA VILLOSA Duby. North Carolina. 6–35.
12. DESMARESTIA VIRIDIS Lamoroux. New York and North. 12–36.
13. DESMARESTIA ACULEATA Lamoroux. New Jersey and North. 12–80.
14. LAMINARIA SACCHARINA Lamoroux. (*Venus' Girdle.*) Cape May and N. 12–120.
15. LAMINARIA DIGITATA Linnæus (*Oar-weed*). Long Island and North. 40–144.
16. LAMINARIA LOREA Bory. Newfoundland. 24–60.
17. LAMINARIA LONGICRURIS De la Pylaie. Rhode Island and North. 60–100.
18. LAMINARIA FASCIA Agardh. New Jersey and North. 2–12.
19. LAMINARIA DERMATODEA De la Pylaie. Newfoundland. 50.
20. ALARIA ESCULENTA Greville (*Badderlocks*). Cape Cod and North. 36–250.
21. AGARUM TURNERI Postels and Ruprecht (*Sea Colander*). Cape Cod and N. 50–160.
22. CHORDA FILUM Stack. (*Lucky Minny's Lines*). Cape May and North. 15–500.
23. CHORDA LOMENTARIA Lyngby. Charleston and North. 8–18.
24. STILOPHORA RHIZODES Agardh. New Jersey and North. 4–5.
25. DICTYOSIPHON FŒNICULACEUS[†] Greville. New Jersey and North. 6–24.
26. STRIARIA ATTENUATA Greville. New York. 2-3.
27. PUNCTARIA TENUISSIMA Greville. New Jersey and North. 2–10.
28. PUNCTARIA PLANTAGINEA Greville. Cape Cod and North. 6–12.
29. PUNCTARIA LATIFOLIA Greville. New Jersey and North. 8–12.
30. ASPEROCOCCUS ECHINATUS Greville. Massachusetts. 5–24.
31. CHORDARIA FLAGELLIFORMIS Agardh. New Jersey and North. 12–24.
32. CHORDARIA DIVARICATA Agardh. Long Island and North. 12–30.
33. MESOGLOIA VERMICULARIS Agardh. Halifax. 12–18.

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[*] More than 120 species of Sargassum have been described, many of them being distinguished by indefinite or inconstant characters. Prof. Agassiz, who had given this group some special attention, expressed his decided opinion that our eight or ten American "species" were merely forms or varieties of one and the same plant. Specimens with blended characters of Nos. 1 and 2 are not uncommon.

[†] In the AMERICAN NATURALIST for August, 1873, notice is given of a discovery of mine of a specimen of DICTYOSIPHON FŒNICULACEUS growing on CHORDARIA FLAGELLIFORMIS not as a parasite, but as a branch of the same plant. Unless there was some mistake, either in observation or in identification, this would show, as was believed long ago by Areschoug, that Dictyosiphon is merely an abnormal state of *Chordaria flagelliformis.*

34. MESOGLOIA VIRESCENS Carmichael. Massachusetts and South. 2–12.
35. MESOGLOIA ZOSTERÆ Areschoug. Halifax. 6–8.
36. LEATHESIA TUBERIFORMIS Gray. Whole Coast. ½–1½.
37. ELACHISTA FUCICOLA Fries. Whole Coast. 1 or less.
38. MYRIONEMA STRANGULANS Greville. Coast. One-tenth.
39. CLADOSTEPHUS VERTICILLATUS Agardh. Long Island and North. 3–8.
40. CLADOSTEPHUS SPONGIOSUS Agardh. Long Island and North. 2–5.
41. SPHACELARIA CIRRHOSA Agardh. New York and North. 1–2.
42. SPHACELARIA RADICANS Dillwen. Massachusetts. ½.
43. ECTOCARPUS BRACHIATUS Harvey. Massachusetts and North. 2–4.
44. ECTOCARPUS LITTORALIS Lyngby. Virginia and North. 6–12.
45. ECTOCARPUS SILICULOSUS Lyngby. Whole Coast. 3–6.
46. ECTOCARPUS TOMENTOSUS Lyngby. Massachusetts and North. 2–6.
47. ECTOCARPUS FASCICULATUS Harvey. New Jersey to Massachusetts. 3–6.
48. ECTOCARPUS GRANULOSUS Agardh. Massachusetts. 4–8.
49. ECTOCARPUS DURKEEI Agardh. New Hampshire. ——. 2.
50. ECTOCARPUS MITCHELLÆ Harvey. Nantucket. 2–3.
51. ECTOCARPUS LANDSBURGI Harvey. Nova Scotia. 1–2.
52. ECTOCARPUS HOOPERI Harvey. New York (?). 3–8.
53. MYRIOTRICHIA FILIFORMIS Griffiths. Maine. 1–2.

HUMAN REMAINS IN THE SHELL HEAPS OF THE ST. JOHN'S RIVER, EAST FLORIDA. CANNIBALISM.*

BY PROF. J. WYMAN.

AFTER repeated examinations of the more important shell heaps on the St. John's, we have failed to find any evidence that they were used for the burial of the dead, or for any other purpose than dwelling places. Human bones have, however, been discovered in them, from time to time, under peculiar circumstances, and as their presence opens a question of much interest, it will be desirable to describe in detail each of the instances in which they have been detected, especially where the bones have been found in considerable numbers.

1. The first which came under the notice of the writer, was at Old Enterprise, on Lake Monroe, in 1861, a few rods above the high bluff and near the shore of the lake. The deposit of shells where the bones were found is about four feet thick, and has been much washed away by the waves during the great storms. While making an excavation near the roots of a large palmetto tree

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* We are permitted to print this paper in advance from the "Sixth Annual Report of the Peabody Museum of Anthropology," now in press.—EDS.